CHAPTER I

EXECUTIVE SUMMARY AND RECOMMENDATIONS

Note: This Report makes numerous references to the *1996 New Jersey State Water Quality Inventory Report*. Copies of the 1996 Report are available by contacting the Department's Office of Maps and Publications, at the address and phone number provided on the Title Page of this 1998 Report.

Chapter 1 consists of two sections:

- An Executive Summary of each chapter and the Appendix of this Water Quality Inventory Report
- Recommendations based on the findings of this Report

EXECUTIVE SUMMARY

This 1998 edition of New Jersey's Water Quality Inventory Report is an abbreviated report which focuses on updated and new information not available for the 1996 Report. This Report also reiterates the statewide designated use support summaries that were published in the 1996 Report. These statewide designated use assessments presented in the 1996 Report are still current. Readers are referred to Chapter II for further details.

Chapter I: Recommendations

Many recommendations in earlier 305(b) Reports have been implemented. Recommendations that continue to require attention and support are listed below. Additional detail is provided in the Recommendations Section of Chapter 1.

- Maintain federal section 106 funding at or above 1997 levels in New Jersey and other northeastern states to support monitoring and assessment.
- Expand and support water assessment and analysis capabilities within the Department.
- Expand and support ambient monitoring for estuarine waters.
- Implement effective nonpoint source (NPS) pollution control.

Chapter II: Introduction and Background

The *New Jersey State Water Quality Inventory Report* is prepared every two years, pursuant to section 305(b) of the federal Clean Water Act (P.L. 95-217). The 1998 edition of the *New Jersey State Water Quality Inventory Report* is an abbreviated report as per USEPA guidance that focuses on updated and new information not available for the 1996 Report. In addition, this Report reiterates the statewide designated use support summaries that were published in the 1996 Report.

The 1996 Report focused on detailed statewide water quality assessments using chemical/ physical and biological (benthic macroinvertebrate) data collected between 1991 through 1995 inclusive. For details regarding these assessments, the reader is referred to the 1996 Report. This 1998 Report covers information up to the end of 1998 and addresses the following topics:

- Detailed assessments of suspected sources and causes of water quality impairment four the Watershed Management Areas (WMAs) Passaic River Basin (WMAs 3, 4 and 6) and the Rancocas/Pennsauken/Cooper River Watersheds (WMA 19).

- Summaries of natural ground water quality underlying WMA 6 and general ground water quality underlying WMA 19.

- Updated descriptions of the Department's principal water quality monitoring programs including the new and more comprehensive surface water quality monitoring network and proposed ground water monitoring network.

Chapter III: Surface Water Assessment

To the extent possible, designated use assessments are presented in the context of environmental goals, milestones and indicators for water resources developed as part of a Results-Based Management System, which is described in Chapter V. Components of this system include NJDEP's Strategic Plan and National Environmental Performance Partnership System (NEPPS). Goals, milestones and indicators were developed under the Strategic Plan and NEPPS with significant input from water managers within NJDEP and stakeholders, including the regulated community, environmental groups and citizens.

Through Watershed Management, it is expected that water goals, milestones and indicators will be tailored to meet watershed needs, and will inform the statewide effort. The Results-Based Management System, including the Strategic Plan, NEPPS and Watershed Management are described in Chapter 5 of this Report.

Clean and Plentiful Water Goal

New Jersey's rivers, lakes and coastal waters will be fishable, swimmable and support health ecosystems. Surface and ground water will be clean sources of water. Every person in New Jersey will have safe drinking water. Adequate quantities of surface and ground water will be available for all needed uses.

Freshwater Aquatic Life Designated Use Milestone: By 2005, 50% of assessed non-tidal river miles will support healthy, sustainable, biological communities.

A total of 3,815 out of 6,450 stream miles (59.1%) have been assessed for their ability to support a healthy and diverse aquatic community using benthic macroinvertebrate assessments conducted in the Ambient Biological Monitoring Network (AMNET). The spatial extent of this assessment is based on EPA Guidance for Preparation of Water Quality Inventory Reports. (EPA, 1997). Each station was assumed to represent 5 miles of stream. Based on these data, 35 percent fully support the use, 53 percent partially support the use and 12 percent of the assessed miles fail to support the use.

Recreational Designated Use Objective: Maintain and improve the current number and quality of suitable lake, ocean and bay bathing beaches in NJ.

A total of 390 of 6450 river miles (8.1%) have been assessed for sanitary quality necessary to support swimming (i.e., primary contact recreation). This assessment is based on fecal coliform concentrations in water samples at 79 non-tidal stream stations in the Ambient Stream Monitoring Network (ASMN), each representing 5 miles.. Based on these data, 25 percent support the use, 31 percent partially support the use, and 44 percent are not of a sanitary quality necessary to support the use. The stations monitored in this network do not include bathing beaches. However, fecal coliform bacteria and other pathogenic pollution can be transported to bathing beaches potentially degrading water quality in designated swimming areas.

Freshwater Lakes
Lake eutrophication milestone or objective: not developed

In New Jersey there are 380 public lakes representing 24,000 acres. To date, 116 lakes, representing a total of 10,462 acres, have been evaluated for trophic status in New Jersey. All freshwater lakes assessed are found to be either threatened or impaired by eutrophication. Eutrophication is a natural process that is being accelerated by additional inputs of nutrients and suspended sediments. Also, most lakes in New Jersey are not natural but instead are shallow stream impoundments which make them highly prone to eutrophication.

Recreational Designated Uses in Lakes Milestone: By 2000, the recreational lake beach waters will have been assessed and water quality improvement projects will have been prioritized.

Currently, 189 lake bathing beaches have been identified for assessment. Assessment results will be provided in the 2000 Water Quality Inventory Report.

Coastal Waters

Recreational Designated Use Milestone: By 2005, 100% of New Jersey's coastal recreational beach waters will be safe for swimming.

Currently, 76% of New Jersey's 179 ocean and 138 bay beaches are not susceptible to recurrent

beach closings. The ocean beaches from Sandy Hook south to Cape May are considered to be fully swimmable because closures are infrequent and short-term. Generalizations regarding bay beach closures are difficult to make, however on a local basis, bay beach closures have been a serious problem on occasion. Some locations have only occasional closures while other regions, not designated for swimming, have chronically elevated bacterial levels and do not support swimming. Back-bay and estuary beaches assessed for swimming include those within southern Raritan Bay and Delaware Bay.

Shellfish Consumption Designated Use Milestone: By 2005, 90% of New Jersey's classified waters will provide shellfish that are safe to harvest.

The Department monitors the sanitary quality of bay, estuarine and ocean waters for the suitability of shellfish harvesting by observing measurements of coliform bacterial concentrations in the water column, and through shoreline surveys. Currently, about 2500 stations are used to monitor 1053 square miles of waters classified for shellfish harvest in the Shellfish Sanitation Program. Based on these data, 87% of New Jersey's classified ocean, estuarine and bay waters provide shellfish that are open for harvest, and 13% do not support shellfish harvest The shellfish waters that support harvesting have increased from 75% in 1977 to 87% in 1998.

Toxic Substances in Fish Tissue

Fish Consumption Designated Use Objectives:

- Reduce toxic contamination in fish tissue, and therefore reduce the need for fish consumption advisories.
- Evaluate fish tissue for contamination, update advisories and provide public education.

Due to elevated levels of chlordane, dioxin and PCBs in tidal fish species, and elevated levels of mercury in freshwater species, New Jersey has issued fish consumption advisories and bans for affected species and waterways. A study is onging to evaluate older advisories.

The Delaware River Basin Commission has identified PCBs, chlordane and mercury in tidal and nontidal portions of the Delaware River as impairing fish consumption. The Commission has also identified volatile organic chemicals as impairing drinking water use within the tidal portion of the Delaware River.

Source and Cause Assessment

Assessments of suspected sources and causes of water quality impairment within the Watershed Management Areas (WMAs) of the Passaic River Basin (WMAs 3, 4 and 6) and the Rancocas/Pennsauken/Cooper River Watersheds (WMA 19) are provided in Chapter 3.

Water Quality Status and Trends

A study of water quality status with respect to applicable Surface Water Quality Standards and trends over 20 years was conducted. Results are summarized in Chapter III. Results of a more recent study will be summarized in the 2000 Water Quality Inventory Report.

Chapter IV: Ground Water Quality and Management

Ground Water Goal

To protect and enhance the quality of ground water and assure that adequate quantities of ground water will be available for domestic, municipal, industrial and other purposes as well as serving a vital role in maintaining aquatic ecology by providing ground water base flow to receiving waters

The ground water underlying WMA 6 was characterized. The results indicate natural ground water quality is acceptable for potable use. Localized ground water contamination was identified in some areas.

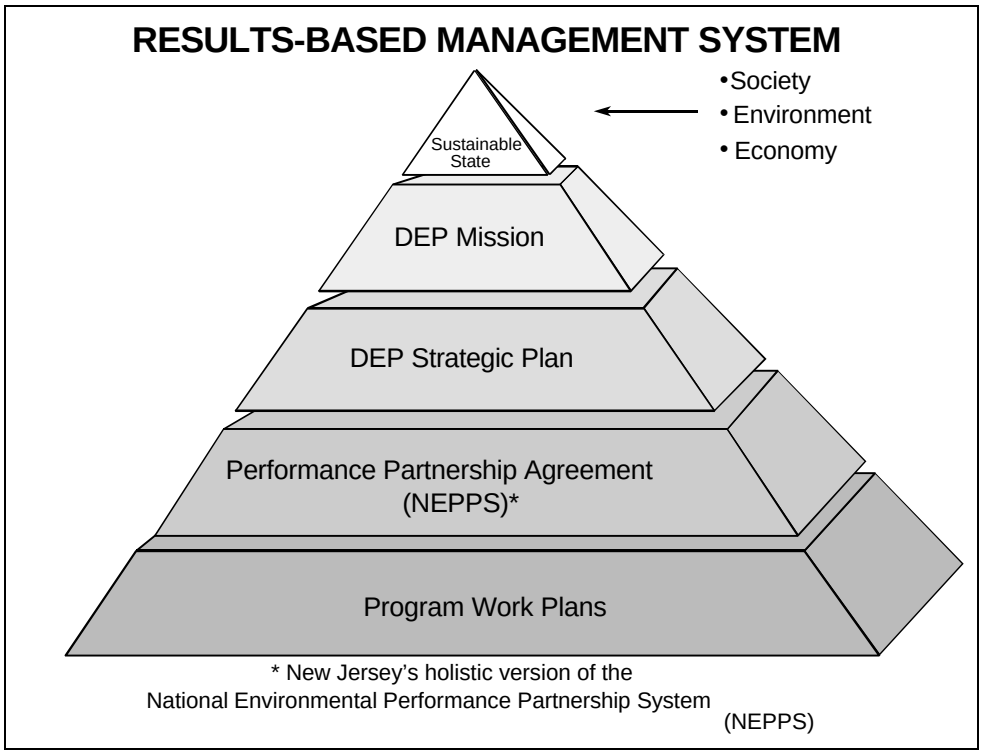
In WMA 19, wells underlying 3 categories of land uses, urban, agricultural and undeveloped, were sampled. In general, nitrate + nitrite levels were lowest in the undeveloped land use areas, and higher in the locations classified as agricultural or urban land use. Detectable levels of volatile organic compounds (VOCs)were found in wells in all three land uses. The most frequently encountered VOCs were chloroform and methyl tert butyl ether (MTBE).

In 1997, the NJDEP and USGS began to redesign the ambient ground water quality monitoring network to better meet current and future information needs of the two agencies, including assessing progress toward meeting the ground water goal and objectives included in the NEPPS Performance Partnership Agreement. The proposed goals for the redesigned ground water network are to assess the status of shallow ground water quality, evaluate pollution sources, assess trends, establish correlations with land use, and identify emerging issues.

Chapter V: Surface Water Monitoring and Pollution Control Programs

Development and Implementation of Results Based Management System

New Jersey has adopted a tiered planning approach in its environmental management efforts so as to ensure that all aspects are fully integrated. The figure below represents the framework of New Jersey's overall environmental management efforts. At the top of the pyramid is New Jersey's sustainable state efforts, followed by NJDEP's mission and Strategic Plan. The Strategic Plan is implemented through New Jersey's participation in NEPPS and, specifically, through the PPA, which is supported by program workplans. At each decreasing level of the pyramid, the amount of detail contained within the approach also increases. Additionally, the time horizon for the strategies changes from the Strategic Plan (4 year document) to the PPA (multi-year document) to the program workplans (annual).



Improvements to Surface Water Quality Standards

In April 1998, the Department adopted amendments to the Surface Water Quality Standards upgrading the water quality classification of 17 segments from non-trout to trout maintenance or trout maintenance to trout production. These changes in classifications were based on actual field data. Additional segments are being proposed for reclassification to trout maintenance or trout production in the Fall of 1999.

Development and Implementation of the Statewide TMDL Schedule

A principal water quality management strategy of the Department is the development and implementation of *Total Maximum Daily Loads* or TMDLs. The TMDL process provides a holistic framework for water quality assessment and management. Waterbodies that do not meet Surface Water Quality Standards are identified through monitoring and listed on a Impaired Waterbodies List, prepared pursuant to Section 303(d) of the Federal Clean Water Act. Then as, water quality problems are thoroughly delineated through monitoring and modeling. As appropriate, Total Maximum Daily Loads are developed to manage point and nonpoint sources through permits and other regulatory and non-regulatory measures as agreed on in Watershed Management Plans.

NJDEP and EPA signed a Memorandum of Agreement (MOA) on May 10, 1999 for TMDL development that includes a schedule for completing all needed TMDLs by 2007. TMDLs are currently being developed in the Whippany River Watershed, Delaware River Estuary and New York-New Jersey Harbor. In addition, efforts are underway to evaluate waterbodies on the 1998 Impaired Waterbodies List. Based on these data, waterbodies may be removed from the list for some or all listed pollutants, recommended for additional monitoring or TMDL development as

appropriate.

Surface Water Quality Monitoring
Monitoring data are used to establish baseline conditions, determine water quality trends, identify water pollution solutions or further clarify water quality problems. The NJDEP's primary surface water quality monitoring unit is the Office of Water Monitoring Management.

A new surface water river/stream physical/chemical monitoring network was designed by an NJDEP and USGS interagency committee. The redesigned Ambient Stream Monitoring Network has been operating since the fall of 1997. This redesigned network focuses on water quality status and trends to support the development of indicators, identify pollution sources and assess relative pollution impacts in each of the Department's 20 watershed management areas. The network includes 5 types of monitoring stations, which provide integrated information regarding surface water quality in New Jersey. In addition, a project is being conducted to continue to evaluate and improve the monitoring network design and to develop a data analysis guidance manual.

In addition to the Ambient Stream Monitoring Network described above, monitoring has been conducted to evaluate waterbodies listed for metals and nutrients on the Impaired Waterbodies List (303d). Thus far, 303d Evaluation Monitoring has been conducted in the Passaic Basin (WMAs 3, 4, 6), Monmouth County Watersheds (WMA 12), the Cooper/ Rancocas/ Pennsauken Watersheds (WMA 19), the Saddle/ Hackensack (WMA 5). Monitoring is planned for the remaining WMAs. Results are being evaluated and will be used, as appropriate, to propose delisting, recommend additional monitoring or TMDL development.

Plans for Comprehensive Assessments of Water Quality in New Jersey
To support EPA and NJDEP environmental and programmatic goals, the Department has begun to employ probabilistic monitoring and assessment techniques to facilitate assessment of state-wide status of surface and ground water quality. Data collection for surface waters began in 1997; monitoring for ground water is expected to begin in mid-1999.

In addition, the Department has recently formed a Water Assessment Team in the Division of Science, Research and Technology. This Team is responsible for assessing surface and ground water quality data to support the Water Quality Inventory Report (305b), the Impaired Waterbodies Listing (303d), Watershed Characterization and Assessments and Water Quality Indicators.

Appendix
The appendix presents waterbody-specific (HUC-11) tabular information regarding suspected sources and potential causes of aquatic life and recreational designated use impairments which in turn form the basis for the Sources and Causes tables presented in Chapter III. Also presented are detailed explanations of the process by which these tables were generated, including a detailed description of an example assessment within the Whippany Watershed for illustrative purposes.

RECOMMENDATIONS FOR IMPROVING WATER QUALITY IN NEW JERSEY

Introduction

It was clear from discussions contained in the 1996 305(b) Report that much progress has occurred in New Jersey in improving water quality on a statewide basis. However, it is also clear that much work remains to be done. The 1996 Report stated that many recommendations issued in past State Water Quality Inventory Reports have become standard practice within this Department and many of the recommendations in the 1996 Report have been implemented.

Previous State Water Quality Inventory Reports, including the 1996 edition, recommended an increase in water quality monitoring activities. The 1996 edition specifically recommended that the State commit to supporting the Ambient Stream Monitoring Network at the 1996 level (79 sites). This Network provides physical, chemical and sanitary water quality data in freshwater nontidal streams. The 1996 Report further recommended that a broad-based intensive-survey monitoring program be implemented in the State, designed to supplement the existing ambient monitoring network.

We are pleased to state that since the release of the 1996 Report, the Department has made significant improvements to the Ambient Stream Monitoring Network and has increased overall financial support for monitoring. Chapter V in this Report describes the redesigned Ambient Stream Monitoring Network that significantly improves fixed location monitoring network along with site-specific intensive monitoring to support the Department's Watershed Management Program.

The 1996 Report recommended that all pollutant loading limitations (from point and nonpoint sources) be based upon the water quality standards applicable to the receiving waters and the waters' assimilative capacity. Further, the 1996 Report recommended that resources be allocated to support modeling studies to establish Total Maximum Daily Loads (TMDL) within waterways with known use impairments. A clear understanding of the assimilative capacity of the receiving waters and knowledge of the relative contributions from pollution sources would significantly aid the Department in establishing effective point and nonpoint pollutant loading limits.

As a consequence of the 303(d) process and TMDL Memorandum of Agreement between this Department and EPA Region II, TMDLs will become standard procedures within the Watershed Management Program. Chapter V includes the current TMDL development schedule for all waterways on the New Jersey 303(d) List. In addition, 303d Evaluation Monitoring is being conducted to evaluate waterbodies listed for metals and nutrients on the 1998 303d List.

Current Recommendations

Recommendations based upon the conclusions in this and the 1996 report that continue to require attention and support are listed below. New recommendations are expected to arise as the watershed-based projects expand and more is understood regarding pollution sources in our state

and the most effective ways to manage them.

Maintain Federal section 106 funding at or above 1997 levels in New Jersey and Other Northeastern States. New Jersey, along with other heavily industrialized states, must assess and mediate extensive water quality impairments brought about by dense population centers compounded by decades of historical pollution. Significant efforts must still be made to identify, monitor and address the sources of pollution and causes of impairment. In New Jersey, section 106 funds are critical to maintaining the redesigned ambient stream monitoring program, implementing proposed revisions to the ground water quality monitoring network, implementing cooperative source and cause data collection with stakeholders and assessing these data so that they become useful information for management decisions. Further, New Jersey and other states need flexibility to focus on the highest priority state and regional data collection and assessment needs.

Expand And Support Ambient Monitoring For Estuarine Waters. New Jersey's estuaries play a significant role in the vitality of the state's economy and their resource value is well documented. Despite this, little ambient monitoring has been performed in these waters until recently. The marine/estuarine water quality monitoring network has begun collecting data on a wide range of physical/chemical parameters throughout the state's coastal waters and this much needed ambient monitoring effort should continue.

Expand and Support Water Assessment Capabilities. The Department recently formed a Water Assessment Team in the Division of Science, Research and Technology. This Team is responsible for assessing surface water quality data to support Water Quality Inventory Report (305b), the Impaired Waterbodies Listing (303d), Watershed Characterization and Assessments and the Water Quality Indicators. These assessments support TMDL planning and Source Water Assessments. These assessments will be based on data generated by NJDEP, other agencies, and stakeholders.

NJDEP should continue to improve data management and assessment through implementation of Environmental Data Exchange (ENDEX). ENDEX is an Internet based platform that will facilitate electronic exchange of data between all users (agency and stakeholders); provide access to major databases (e.g., STORET, BIOS, ODES, etc.); provide a card catalogue of available datasets; and provide analysis tools that utilize GIS and statistical methods. These aspects of ENDEX are intended to facilitate and streamline data management and assessment. NJDEP and a consultant developed a conceptual framework for ENDEX in 1997. An ENDEX Implementation Team has formed to develop the software for ENDEX.

Implement effective nonpoint source (NPS) pollution controls. An effective nonpoint source management program is essential to attaining water quality goals including compliance with surface and ground water quality standards. The understanding of nonpoint source contributions to water quality problems and methods to control specific nonpoint sources is limited but improving through the Watershed Management Program, updates to the Nonpoint Source Program Plan and several research and demonstration projects. Based on this understanding, the NJDEP should build capacity at the local level to address nonpoint sources and work to ensure

that adequate funding is available. Key components of comprehensive nonpoint source management should be implemented through adopted Watershed Management Plans and include as appropriate the municipal stormwater management and permitting program, education and outreach, financial and technical assistance and incentives, partnerships with other state and local entities and open space preservation.